

niently larger than a 8.5×11 inch sheet of paper, so that one can place one or more sheets of paper (or other relatively thin flat objects) inside the closed clamshell like notebook structure in a folding or latching fashion. The user can safely carry papers from location to location without folding or wrinkling them. Thus the unit can act as a carrying device as well as a notebook computer. The outside surfaces and edges of notebook computer may be covered with leather, vinyl of other type of soft material, for easy of hand carrying and surface protection. Other parts may be embodied including foldable short legs 9A and 9B, keyboard resting pads 16A and 16B, built-in audio speaker(s) 30.

FIG. 2 shows the portable computer with several parts detached or disassembled. This embodiment may be used in desktop computer system environments. The flat panel display assembly 2 may be placed at an inclined angle, with foldable leg support means 19A and 19B. The leg support means may fold relatively flush to the backside of the assembly 2 (motion range A) when not in use, via a simple hinge 15. Vertical portions 19A and 19B may slide in and out, in a telescoping type arrangement, to allow wide range inclination angles. A pair of short legs 3 may be placed near the front of assembly 2 that may also fold relatively flush with the back of the assembly. Means may be included to place the screen at a vertical orientation. A pen or stylus input means may be associated with the display screen 4. The pen or stylus means may include finger input (touch panel) means, where one can write or point to area on the display screen. The expandable hinge means 10 may be removed from the assembly 2 and from the cover section 9 by a quick disconnect or disassembly means 5. Alternatively, the hinge means may be fixed to parts 2 and 9. The hinge means may be made of a relatively flexible material, such as leather and vinyl. It may be corrugated as shown in the figure so it can bend easily and expand, as 30 required. The hinge may have a number of attachment slots 12 for the quick dis-attachment or disconnection from hook mechanisms 13. FIG. 2 shows the flexible hinge means 10 removed from the other assemblies.

Cover section 9 may contain a battery power unit containing one or more 35 batteries and power circuit elements. The battery power unit may be embodied with several types of batteries, including Lithium- ion or NiCd batteries. The power unit may be a self contained battery package, having an easy to read charge indicator 22 that indicates the state of the battery's electrical charge. Because all batteries have a limited useful charge life, the package may be easily and quickly disconnected from the keyboard section 16 and replaced with another battery package. Spare battery packages and other spare parts could be carried in a separate traveling case (not shown). The keyboard section 16 may have a full size QWERTY keyboard with movable tactile keys. An electrical cable 20 may connect the keyboard to the computer-display assembly 2. Although short cable is shown, it may be a long cable or a flexible cable, so that the keyboard may be moved about if desired. Alternatively, a wireless electromagnetic link may be embodied such as infrared (IR) or RF links, which would replace electrical cables 20 and 26. The cover section 8 may contain a wireless handset 14, such as a cellular telephone transceiver. The handset may have retractable antenna, small speaker, keypad, built-in microphone and a battery source. This handset 14 may be capable of analog or digital cellular operation, including AMPS, TDMA, CDMA, PCS, CDPD, or equivalent types for communicating with wide area wireless communication networks. The wireless unit 14 can be easily removed from a cutout or recess area 35 in the

cover section 8. The recess area is made slightly larger than the outside dimensions of the handset 14, so it can fit inside the recess with a relatively snug fit. It is important the handset be easily and quickly removed and replaced in the base unit. Alternatively, cover section 8 consist[]of the handset itself, so that a separate cover section with recess would not be required.

The portable computer system's flexible hinge and the cover sections should be made relatively thin so that when the two halves are folded (rotated) closed, it will not be too thick or heavy to carry with one hand. As shown in FIG. 1, legs 3, 5, 19A and 19B may be folded roughly flush with outside surfaces of the unit. The number cover sections are not limited to three. The cellular handset is shown in FIG. 2 may be connected to the computer system by an optional electrical cable 26. A RF transceiver in the wireless telephone would serve as the transceiver for the computer as well. This embodiment might be desirable to reduce the overall cost of the system. However, a wireless RF transceiver and modem may be located in the flat display panel assembly 2 for voice or data communications. An antenna may be embodied on the display assembly 2, with a retractable antenna 32. The display assembly may include the computer system located within the assembly housing. The advantage of this later embodiment is that the telephone 14 and computer system could be operated independently.

The portable computer system may also have means for connection to a non-battery power source, as shown in FIG. 2, via a standard power line cord and plug 28. The system may also have means for connection to an external wire based wide area communications network 33, via cable 29. The wire based wide area network may include one or more telephone networks, cable TV networks and/or computer LAN/WANs. Telephone networks may include POTS, ISDN, ATM or other equivalent types. Several computer interface connection means may be embodied, for example interface slots/connectors as shown (27, 31, and 38). These interfaces might include R/S 232, USB, IEEE 1394, PCMCIA, or other computer I/O (serial or parallel) connections. Useful connections may include a bus extender connection, so that the notebook computer can be interfaced to another more powerful computer. For portability reasons, it is desirable that the modem or digital terminal adapter be built into the computer system unit. Some means for software loading should be included such as a floppy disk or smart card. Internal mass memory of the computer system could include ROM, flash memory, or other memory means. Means for accepting PCMCIA cards, ROM cards or other types of memory card may be implemented. Preferably, the system may be embodied with a very small light weight and low power mini hard disk. One or more IR communications interfaces may also be implemented.

Other capabilities such as FAX send/receive, speech recognition, voice processing voice mail, telephony, and E-mail functions may be implemented in the computer system. A built-in microphone 36 and speaker 30 may be embodied to support speech input/output and multimedia functions. Preferably the display should be capable of full color with a wide viewing angle. If the display is back lit, the user should be allowed to switch the backlight "on", "off" and to a multiplicity of levels in between. The operating system of the notebook/PDA should be a GUI type such as Windows™ 3.1/95, Windows CE™, MagicCap or another suitable GUI based computer operating system. The system should can be designed to support wide range of communication connectivity and software compatibility.

FIGS. 3A and 3B show another embodiment of the invention having a base unit or notebook computer system